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09/992,786	11/13/2001	John Barnes	220772008900	5825

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MORRISON & FOERSTER LLP
755 PAGE MILL RD
PALO ALTO, CA 94304-1018

EXAMINER

LEUNG, JENNIFER A

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 01/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/992,786

Applicant(s)

BARNES, JOHN

Examiner

Jennifer A. Leung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 October 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10,13,16-21,23 and 25-147 is/are pending in the application.
- 4a) Of the above claim(s) 48-146 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10,13,16-21,23,25-47 and 147 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-10,13,16-21,23 and 25-147 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>10-3-05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Applicant's amendment submitted on October 3, 2005 has been received and carefully considered. The changes made to the drawings are acceptable. Claims 11, 12, 14, 15, 22 and 24 are cancelled. Claim 147 is newly added. Claims 48-146 are withdrawn from consideration. Claims 1-10, 13, 16-21, 23, 25-47 and 147 are currently active.

Claim Objections

2. Claim 10 is objected to because the word "distance" in line 2 is stated twice. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-10, 13, 16-21, 23, 25-47 and 147 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, the structural limitation of, "the contact between the struts and the catalyst structure does not cause *significant* deformation of the catalyst structure at *high* axial loads" (lines 23-24) is considered vague and indefinite, because it is unclear as to what applicants consider to be a "significant" deformation, and "high" is a relative term. Furthermore, specific limitations to the contact between the struts and the catalyst structure lack proper positive antecedent basis because the "catalyst structure" is not considered an element of the apparatus (i.e., a catalyst structure is merely stated in the intended use clause of the preamble).

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Similarly, it is unclear as to the structural limitation applicant is attempting to recite by, “the struts are configured to provide substantially uniform support with respect to a substantial portion of the catalyst structure” (lines 27-28) because the “catalyst structure” is not considered an element of the apparatus.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-5, 7, 9, 10, 16-19, 29 and 147 are rejected under 35 U.S.C. 102(b) as being anticipated by Mullov et al. (RU 2 023 465).

Regarding claims 1, 4, 7 and 16, Mullov et al. (FIG. 1, 2; Abstract) discloses a structure (i.e., a horizontal disk **1**; FIG. 1, 2) comprising:

a plurality of struts (i.e., straight strips of sheet material **2,3,4**) configured in at least two branched segments radially arranged about the center (not labeled) of the support structure;

each branched segment comprising a primary strut **2** with a proximal end proximal to the center and a distal end extending toward the perimeter (i.e., defined by circle **6**; FIG. 2);

each branched segment comprising a secondary strut **4** with a proximal end in contact with the primary strut **2** (i.e., at circle **7**) and a distal end extending toward the perimeter **6**; and

each branched segment comprising additional secondary struts **3** with proximal and distal ends, the additional secondary struts **3** alternating in a branched fashion in a direction from the center toward the perimeter, wherein the proximal end of each additional secondary strut **3**

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contacts the previous strut 2,4 toward the center (i.e., at circle 5) and the distal end of each additional secondary strut 3 extends toward the perimeter 6.

Regarding claim 2, the distance between alternate consecutive secondary struts 4,3 is substantially constant (see FIG. 2).

Regarding claim 3, at least one strut 2,3,4 of one branched segment (i.e., within a first disk 1; FIG. 1, 2) is parallel to at least one strut 2,3,4 of another branched segment (i.e., within a second disk 1, disposed parallel to the first disk 1; FIG. 1, 2).

Regarding claim 5, struts 4,3 are substantially parallel to each other.

Regarding claim 9, each consecutive strut 3 is connected to the previous strut 2,4 at a variable distance (i.e., as defined by circle 5, or as defined by the distance between circles 5 and 7, respectively; see FIG. 2) from the proximal end of the previous strut 2,4.

Regarding claim 10, each consecutive strut 4 is connected to the previous strut 2 at a constant distance (i.e., as defined by circle 7) from the proximal end of the previous strut 2 (see FIG. 2). Also, each consecutive strut 3 is connected to the previous strut 2 at a constant distance (i.e., as defined by circle 5) from the proximal end of the previous strut 2. Also, each consecutive strut 3 is connected to the previous strut 4 at a constant distance (i.e., as defined by the distance between circles 5 and 7) from the proximal end of the previous strut 4.

Regarding claims 17-19 and 147, a hub is located at the center of the support structure, wherein a center spindle is attached to the hub (see FIG. 1). A second support structure (i.e., the middle horizontal disk 1 structure) is attached to the center spindle upstream of a first support structure (i.e., the top or bottom disk 1 structure, depending on the direction of flow).

Regarding claim 29, the extracting column (not shown, see Abstract), which contains the

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structures **1**, inherently defines an outer ring that encompasses the branched segments.

Instant claims 1-5, 7, 9, 10, 16-19, 29 and 147 structurally read on Mullov et al.

5. Claims 1, 2, 4, 5, 7, 10, 16, 17, 25-27, 29-34 and 42-45 are rejected under 35

U.S.C. 102(b) as being anticipated by Grove, Jr. et al. (US 3,073,685).

Regarding claims 1, 4, 7, 16 and 17, Grove, Jr. et al. discloses a structure (i.e., the catalyst support structure shown in FIG. 1, relabeled by the Examiner, below) comprising:

a plurality of struts (i.e., straight support rods **1**, labeled as rods **A**, **B** and **C**); said struts **A,B,C** being configured in at least two branched segments radially arranged about the center (i.e., at hub **X**, comprising castable refractory **2**);

each branched segment comprising a primary strut **A** with a proximal end proximal to the center **X** and a distal end extending towards the perimeter (i.e., towards the reactor wall **3**);

each branched segment comprising a secondary strut **B** with a proximal end that contacts the primary strut **A** and a distal end that extends toward the perimeter (i.e., towards the circular reactor wall **3**); and

each branched segment comprising additional secondary struts **C** having a proximal end in contact with the previous strut **B** toward the center **X** and a distal end extending toward the perimeter (i.e., towards the reactor wall **3**), said additional secondary struts **C** alternating in a branched fashion in a direction from the center toward the perimeter (see Fig. 1).

Regarding claim 2, the distance between alternate consecutive secondary struts **B,C** in a branched segment is substantially constant (see FIG. 1).

Regarding claim 5, alternate secondary struts **B,C** are substantially parallel to each other.

Regarding claim 10, each consecutive strut **B** is connected to the previous strut **A** at a

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constant distance (i.e., as defined by the length of strut **A**) from the proximal end of the previous strut **A**. Also, each consecutive strut **C** is connected to the previous strut **B** at a constant distance (i.e., as defined by the length of strut **B**) from the proximal end of the previous strut **B**.

Regarding claims 25 and 26, the center **X** comprises a refractory ring **2**, configured similarly to the ring shown in FIG. 4. The primary struts **A** are thus connected to the center **X** with slip joints, wherein the proximal end of the primary strut **A** includes at least one tongue (i.e., defined by the end of the strut) and the center includes at least one slot (e.g., a slot **4**, see FIG. 4) for receiving the tongue.

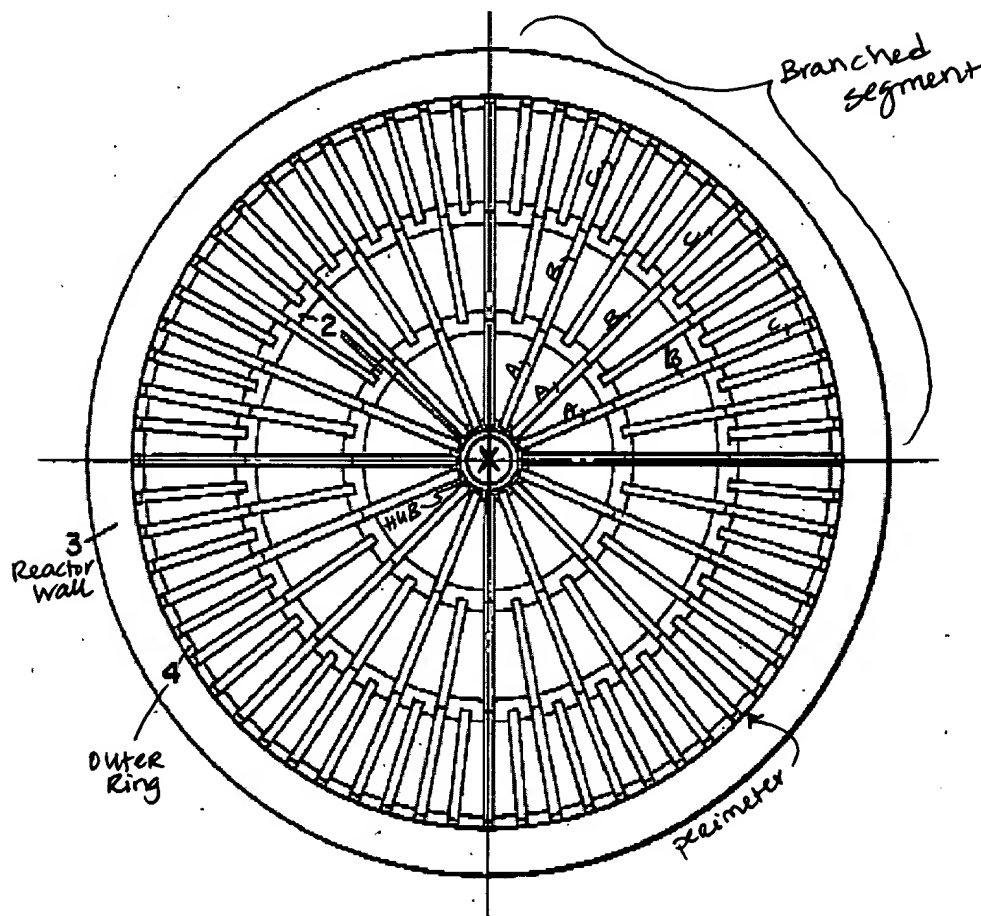
Regarding claim 27, at least one consecutive strut **B** is connected to the previous strut **A** with a slip joint (i.e., as defined by the coupling of the contacting ends of struts **A** and **B** and the refractory ring slots **3**; see FIG. 4).

Regarding claims 29-32, 42 and 43, the support structure comprises an outer ring (i.e., a fire brick ledge **4**; FIG. 1) encompassing the branched segments, the outer ring including a plurality of peaks and troughs (i.e., troughs defined by slots **3**, **4**, **5**; FIG. 4), wherein the distal end of some of the struts (i.e., struts **C**) are coupled to the outer ring at the troughs (i.e., within the slots), thereby defining a slip joint.

Regarding claims 33, 34, 44 and 45, the distal end of at least one strut **A,B,C** includes a flange (i.e., as defined by the end of the strut which overlaps the refractory rings **2** and **4**; FIG. 1); the structure including an outer ring **4** (FIG. 1) having an expansion slot (e.g., slots **4**; FIG. 4) wherein the flange (i.e., the end of the strut) is received within the expansion slot **4**.

Instant claims 1, 2, 4, 5, 7, 10, 16, 17, 25-27, 29-34 and 42-45 structurally read on Grove, Jr. et al.

FIGURE 1 from GROVE, JR. et al. (US 3,073,685)



6. Claims 1-6, 8, 9, 13, 16, 20, 21, 23 and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Brunner et al. (US 5,725,810).

Regarding claims 1, 4 and 16, Brunner et al. (FIG. 8, 9a; FIG. 8 is relabeled by the Examiner, below) discloses a structure comprising:

a plurality of struts (i.e., packing elements 2, formed by sheets 1) configured in at least two branched segments (i.e., three shown in FIG. 8) radially arranged about the center X;

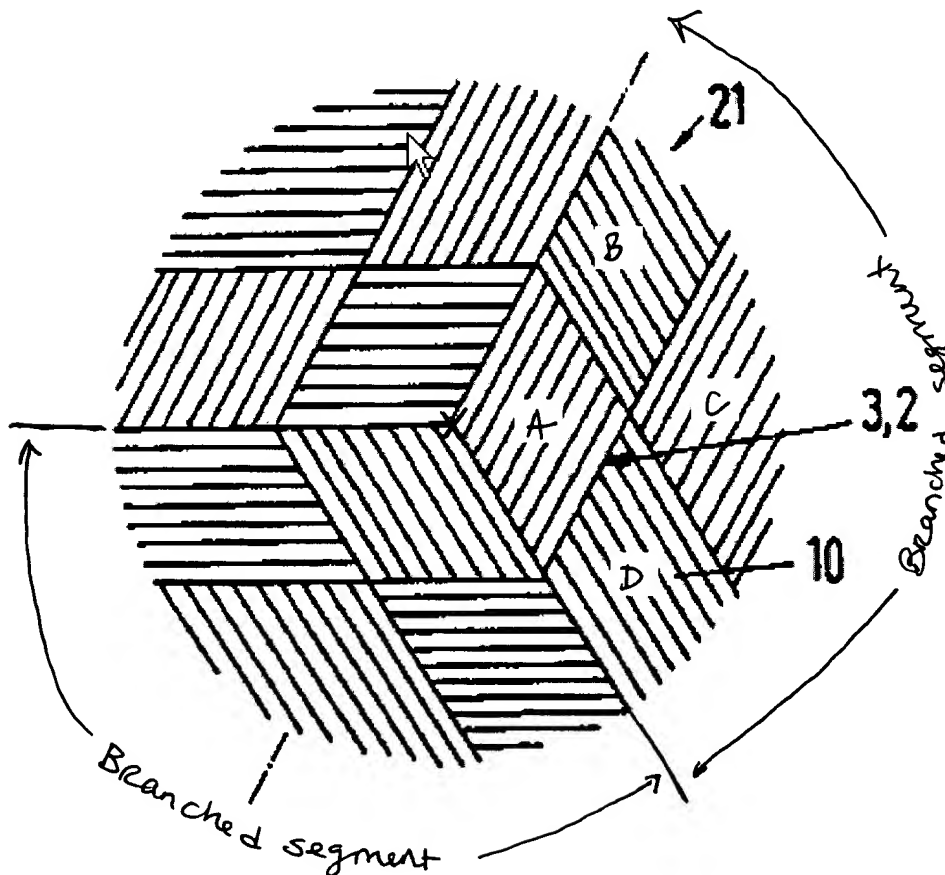
each branched segment comprising a primary strut (i.e., a sheet 1 within section A) with a proximal end proximal to the center X and a distal end extending toward the perimeter;

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each branched segment comprising a secondary strut (i.e., a sheet 1 within section **B**) with a proximal end contacting the primary strut (i.e., the sheet 1 within section **A**) and a distal end extending toward the perimeter; and

each branched segment comprising additional secondary struts (i.e., sheets 1 within sections **C**, **D**) with proximal and distal ends, the additional secondary struts alternating in a branched fashion in a direction from the center **X** toward the perimeter, wherein the proximal end of each additional secondary strut (e.g., sheet 1 within section **C**) contacts the previous strut (i.e., sheet 1 within section **B**) toward the center **X** and the distal end of each additional secondary strut (i.e., sheet 1 within section **C**) extends toward the perimeter.

FIGURE 8 from BRUNNER et al. (US 5,725,810)



Regarding claim 2, the distance between alternate consecutive secondary struts 1 is substantially constant (see FIG. 8).

Regarding claim 3, at least one strut 1 of one branched segment is parallel to at least one strut 1 of another branched segment (see FIG. 8).

Regarding claim 5, alternate secondary struts 1 are substantially parallel to one another (see FIG. 8).

Regarding claims 6, 8, 13, 20, 21 and 23, the struts (i.e., sheets 1) comprise bends or corrugations (see FIG. 7).

Regarding claim 9, each consecutive strut 1 is connected to the previous strut 1 at a variable distance from the proximal end of the previous strut 1 (see FIG. 8).

Regarding claim 29, an outer ring (i.e., as defined by the column wall 5, not drawn in FIG. 8; see FIG. 3) encompasses the branched segments.

Instant claims 1-6, 8, 9, 13, 16, 20, 21, 23 and 29 structurally read on Brunner et al.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 25-28, 39 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mullov et al. (RU 2 023 465).

Regarding claims 25-28, Mullov et al. (Abstract) discloses that, “[t]he disks are made of alternative strips of sheet material arranged radially and rigidly secured to each other and positioned at an inclination to the disk surface.” Mullov et al., however, is silent as to the specific means used for rigidly securing each of the alternative strips to one another. In any

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event, it would have been obvious for one of ordinary skill in the art at the time the invention was made to select a known, suitable means (such as the instantly claimed slip joints) for rigidly securing the strips of sheet material (i.e., the struts) to one another and the center in the structure of Mullov et al., on the basis of suitability for the intended use thereof, because the Examiner takes Official Notice that the use of slip joints for rigidly securing two struts to one another is well known in the art.

Regarding claims 39 and 40 Mullov et al. (Abstract) discloses that, “[t]he disks are made of alternative strips of sheet material arranged radially and rigidly secured to each other and positioned at an inclination to the disk surface.” Mullov et al., however, is silent as to the specific means used for rigidly securing each of the alternative strips to one another. In any event, it would have been obvious for one of ordinary skill in the art at the time the invention was made to select a known, suitable means (such as the instantly claimed braze lugs) for rigidly securing the strips of sheet material (i.e., the struts) to one another and the center in the structure of Mullov et al., on the basis of suitability for the intended use thereof, because the Examiner takes Official Notice that the use of braze lugs for rigidly securing two struts to one another is well known in the art.

8. Claims 35-38, 46 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grove, Jr. et al. (US 3,073,685).

Regarding claims 35, 36, 46 and 47, Grove, Jr. et al. is silent as to the means for attaching the struts to the outer ring 4 (FIG. 1) comprising a T-end being received in an expansion slot. In any event, it would have been obvious for one of ordinary skill in the art at the time the invention was made to substitute another known, suitable means (such as the instantly claimed T-

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end/expansion slot coupling) for securing the struts to the outer ring in the structure of Grove, Jr. et al., on the basis of suitability for the intended use thereof, because the Examiner takes Official Notice that the use of T-end/expansion slot type couplings for securing structural elements is well known in the art, and the substitution of known equivalent structures involves only ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958).

Regarding claims 37 and 38, Grove, Jr. et al. is silent as to the means for attaching the struts to the outer ring 4 comprising a slot located at the distal end of the strut, in which the outer ring is passed through. In any event, it would have been obvious for one of ordinary skill in the art at the time the invention was made to substitute another known, suitable means (such as the instantly claimed slot coupling) for securing the struts to the outer ring in the structure of Grove, Jr. et al., on the basis of suitability for the intended use thereof, because the Examiner takes Official Notice that the use of slot type couplings for securing structural elements is well known in the art, and the substitution of known equivalent structures involves only ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958).

Response to Arguments

9. Applicant's arguments with respect to claims 1-10, 13, 16-21, 23, 25-47 and 147 have been considered but are moot in view of the new grounds of rejection.

Allowable Subject Matter

10. Claim 41 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of

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the base claim and any intervening claims. The prior art does not disclose or adequately teach a support structure wherein the struts are connected to the center or a previous strut using the instantly claimed braze lug that includes at least two flanges, a strut receiving portion coupled to the at least two flanges, at least two tabs coupled to the at least two flanges, and at least one tab coupled to the strut receiving portion.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

As set forth in 37 CFR 1.136(a), a shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

* * *

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is (571) 272-1449. The examiner can normally be reached on 8:30 am - 5:30 pm M-F, every other Friday off.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on (571) 272-1444. The fax phone number for

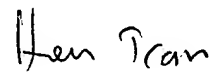
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the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jennifer A. Leung

January 9, 2006 



HIEN TRAN
PRIMARY EXAMINER